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Smoking in pregnancy and child ADHD

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Online-only Supplement

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eMethods

Measures

Covariates: Information about fathers' ADHD symptoms was taken from the first questionnaire, while mothers reported on their symptoms of ADHD in a questionnaire 3 years after the child was born. A short version of the 18-item Adult ADHD Self-Report Scale (ASRS) was used. This consists of four items on inattention and two on impulsivity/hyperactivity. The short scale has been found to be a good predictor of clinically assessed ADHD [1]. Respondents answered each question on a 5-point scale ranging from "Never" to "Very often".

Fathers reported on their own height and weight, and mothers reported on their own and the child's father's height, weight, and educational level. Mothers were asked about their weight when they became pregnant. Women also reported on how often they drank alcohol after becoming pregnant – "Never", "Less than once per month", "1-3 times per month", "Once per week", "2-3 times per week", "4-5 times per week", or "6-7 times per week". Because very few women reported drinking once per week or more (0.6% of the sample), the five latter categories were collapsed to one category "Once per month or more". Information about child's gender, birth weight, birth year, birth month, mothers and fathers' age, the geographical region where the mother lived, and the mother's parity was obtained from the Medical Birth Registry of Norway. Registered birth weight less than 300 grams was considered invalid and coded as missing (n = 95).

eResults

Birth weight: Results from sibling control analyses of the association between maternal smoking and offspring birth weight were the following: $b = -79.38$ ($SE = 31.88$, $p = 0.013$) among sibling discordant for maternal smoking. This association was $b = -153.43$ ($SE = 6.93$, $p < 0.001$) in the total sample.

eTable 1. Overlap (n and percentage) between the three negative controls and maternal smoking during pregnancy.

	Father smoked		Grandmother smoked		Mother smoked in previous pregnancies	
	No	Yes	No	Yes	No	Yes
Mother smoked						
No	67,317 (96.1%)	17,728 (77.4%)	56,606 (94.7%)	19,030 (83.6%)	50,386 (97.6%)	5,093 (53.8%)
Yes	2,701 (3.9%)	5,185 (22.6%)	3,190 (5.3%)	3,724 (16.4%)	1,246 (2.4%)	4,382 (46.2%)
Total	70,018 100%	22,913 100%	59,796 100%	22,754 100%	51,632 100%	9,475 100%

eTable 2. Association between maternal smoking and offspring birth weight (in grams) compared to the associations with three negative controls, not adjusted for each other.

	b	p	95% C.I.
Maternal smoking	-145.64	<0.001	-159.69;-131.59
Paternal smoking	-26.96	<0.001	-35.92;-18.00
Grandmother smoked when pregnant with mother	5.46	0.24	-3.59;14.50
Mother smoked in previous pregnancies	-79.77	<0.001	-93.38;-66.15

Notes: Separate analyses were performed for each of the four smoking variables so that the associations between each of them and offspring birth weight are not controlled for each other. Analyses were adjusted for the following covariates: Maternal and paternal age, maternal and paternal education, maternal and paternal ADHD symptoms, maternal (pre-pregnancy) and paternal BMI, maternal alcohol consumption during pregnancy, parity, child's birth year, and geographical region.

eTable 3. Association between maternal smoking and offspring birth weight (in grams) compared to the associations with three negative controls, mutually adjusted for each other.

	b	p	95% C.I.	F- value^{a)}	p-value F-test
Maternal smoking Paternal smoking	-144.29 -4.07	<.001 .39	-158.71; -129.86 -13.30; 5.16	214.79	<0.001
Maternal smoking Grandmother's smoking	-150.77 17.87	<.001 <.001	-166.04; -135.50 8.75; 26.98	312.16	<0.001
Maternal smoking Maternal smoking in previous pregnancies	-152.22 -19.47	<.001 .016	-186.69; -143.54 -35.29; -3.66	71.85	<0.001

Notes: Analyses were adjusted for the following covariates: Maternal and paternal age, maternal and paternal education, maternal and paternal ADHD symptoms, maternal (pre-pregnancy) and paternal BMI, maternal alcohol consumption during pregnancy, parity, year of child's birth, and geographical region. a) F- values were obtained from testing three null-hypotheses that the association between maternal smoking and offspring birth weight was equal to each of the three other associations (Wald tests). Degrees of freedom = 1 in the numerator and > 1,000 in the denominator in all tests.

eReferences

1. Kessler, R.C., et al., *The World Health Organization Adult ADHD Self-Report Scale (ASRS): a short screening scale for use in the general population*. Psychol Med, 2005. **35**(2): p. 245-56.